

## CLAIMS

What is claimed is:

- 1        1. An image encoder engine for encoding an image, comprising:  
2            an image decomposer for decomposing the image into a header and at  
3        least one image block, each image block having a set of image elements and  
4        each image element having an original image data value;  
5            at least one block encoder for receiving each image block and for  
6        compressing each image block into an encoded image block by associating  
7        each original image data value of the image element with an index to a  
8        derived image data value in a set of quantized image data values; and  
9            an encoded image composer coupled to the block encoder for ordering  
10       the encoded image blocks into a data file.
- 1        2. The image encoder engine of claim 1 further comprising a header  
2        converter coupled to the image decomposer for converting the header into a  
3        modified header.
- 1        3. The image encoder engine of claim 2 wherein the encoded image  
2        composer orders the encoded image block and the modified header into a  
3        data file.
- 1        4. The image encoder engine of claim 1 wherein the block encoder further  
2        comprises a selection module for computing a set of parameters from the  
3        image data values of the set of image elements.
- 1        5. The image encoder engine of claim 1 wherein the block encoder further  
2        comprises a codeword generation module for generating at least one  
3        codeword.

1        6. The image encoder engine of claim 1 wherein the block encoder further  
 2        comprises a construction module for generating the set of quantized image  
 3        data values including at least one codeword and at least one derived image  
 4        data value.

1        7. The image encoder engine of claim 1 wherein the block encoder further  
 2        comprises a block type module for selecting an identifiable block type for the  
 3        image block.

1        8. An image decoder engine for decoding an encoded image data file,  
 2        comprising:  
 3                an encoded image decomposer for decomposing the encoded image  
 4        data file into a modified header and at least one compressed image block,  
 5        each image block having at least one associated codeword and a plurality of  
 6        image elements associated with an index value;  
 7                at least one block decoder coupled to the encoded image decomposer  
 8        for decompressing the at least one compressed image block into at least one  
 9        decompressed image block by generating a set of quantized image data  
 10        values and mapping the index value to a quantized image data value from the  
 11        set of quantized image data values; and  
 12                an image composer for ordering the at least one decompressed image  
 13        blocks in an output data file.

1        9. The image decoder engine of claim 8 wherein the set of quantized image  
 2        data values include the at least one codeword and at least one image data value  
 3        derived from the at least one codeword.

1        10. The image decoder engine of claim 8 further comprising a header converter  
 2        coupled to the encoded image decomposer for converting the modified header into  
 3        an output header.

1 11. The image decoder engine of claim 10 wherein the image composer orders  
2 the at least one decompressed image block and the output header into a data file.

1 12. The image decoder engine of claim 8 wherein the at least one block decoder  
2 further comprises a block type detector for selecting a block type for each of the at  
3 least one compressed image block.

1 13. The image decoder engine of claim 8 wherein the at least one block decoder  
2 further comprises a decoder for decompressing each of the at least one compressed  
3 image block based on a block type.

1 14. The image decoder engine of claim 8 wherein the at least one block decoder  
2 further comprises an output selector for outputting the at least one decompressed  
3 image block.

1 15. A method for fixed-rate block-based image compression of an original image,  
2 comprising the steps of:

3 decomposing the original image into a header and a plurality of image blocks  
4 each having a set of image elements with an original image data value;

5 computing at least one codeword from the original image data value for the  
6 set of image elements;

7 generating a set of quantized image data values including the at least one  
8 codeword and at least one image value derived from the at least one codeword; and

9 mapping the original image data value to one of the quantized image data  
10 values to produce an index value for each image element.

1 16. The method of claim 15 further comprising outputting an encoded image  
2 data file.

1 17. The method of claim 15 further comprising the step of converting the header  
2 into a modified header.

1        18. The method of claim 17 further comprising the step of composing the  
2        modified header and encoded image blocks into the encoded image data file.

1        19. A machine readable medium having embodied thereon a program being  
2        executable by a machine to perform method steps for fixed-rate block-based image  
3        compression of an original image, the method steps comprising:  
4                decomposing the original image into a header and a plurality of image blocks  
5        each having a set of image elements with an original image data value;  
6                computing at least one codeword from the original image data value for the  
7        set of image elements;  
8                generating a set of quantized image data values including the at least one  
9        codeword and at least one image value derived from the at least one codeword; and  
10               mapping the original image data value to one of the quantized image data  
11        values to produce an index value for each image element.

1        20. The machine readable medium of claim 19 further comprising the method of  
2        outputting an encoded image data file.

1        21. An image encoder system for encoding an original image, comprising:  
2                means for decomposing the original image into a header and a plurality of  
3        image blocks each having a set of image elements with an original image data value;  
4                means for computing at least one codeword from the original image data  
5        value for the set of image elements;  
6                means for generating a set of quantized image data values including the at  
7        least one codeword and at least one image value derived from the at least one  
8        codeword; and  
9                means for mapping the original image data value to one of the quantized  
10        image data values to produce an index value for each image element.

1        22. The image encoder system of claim 21 further comprising means for  
2        outputting an encoded image data file.

1        23. A method for fixed-rate block-based image decompression of an encoded  
 2 image, comprising the steps of:  
 3            decomposing the encoded image of into a modified header and a plurality of  
 4 encoded image blocks having at least one codeword and a plurality of image  
 5 elements associated with an index value;  
 6            generating a set of quantized image data values including the at least one  
 7 codeword and at least one image value derived from the at least one codeword; and  
 8            mapping the index value for each image element to one of the quantized  
 9 image data values.

1        24. The method of claim 23 further comprising outputting a decoded image data  
 2 file.

1        25. The method of claim 23 further comprising the step of converting the  
 2 modified header into an output header.

1        26. The method of claim 25 further comprising the step of composing the output  
 2 header and decoded image blocks into the decoded image data file.

1        27. A machine readable medium having embodied thereon a program being  
 2 executable by a machine to perform method steps for fixed-rate block-based image  
 3 decompression of an encoded image, the method steps comprising:  
 4            decomposing the encoded image data file into a modified header and a  
 5 plurality of encoded image blocks having at least one codeword and a plurality of  
 6 image elements associated with an index value;  
 7            generating a set of quantized image data values including the at least one  
 8 codeword and at least one image value derived from the at least one codeword; and  
 9            mapping the index value for each image element to one of the quantized  
 10 image data values.

1        28. The machine readable medium of claim 27 further comprising the method of  
2        outputting a decoded image data file.

1        29. An image decoder engine for decoding an encoded image data file,  
2        comprising  
3            means for decomposing the encoded image data file into a modified header  
4        and a plurality of encoded image blocks having at least one codeword and a  
5        plurality of image elements associated with an index value;  
6            means for generating a set of quantized image data values including the at  
7        least one codeword and at least one image value derived from the at least one  
8        codeword; and  
9            means for mapping the index value for each image element to one of the  
10        quantized image data values.

1        30. The image decoder engine of claim 29 further comprising means for  
2        outputting a decoded image data file.